

UN COPUOS Guidelines for space sustainability: space weather guidelines



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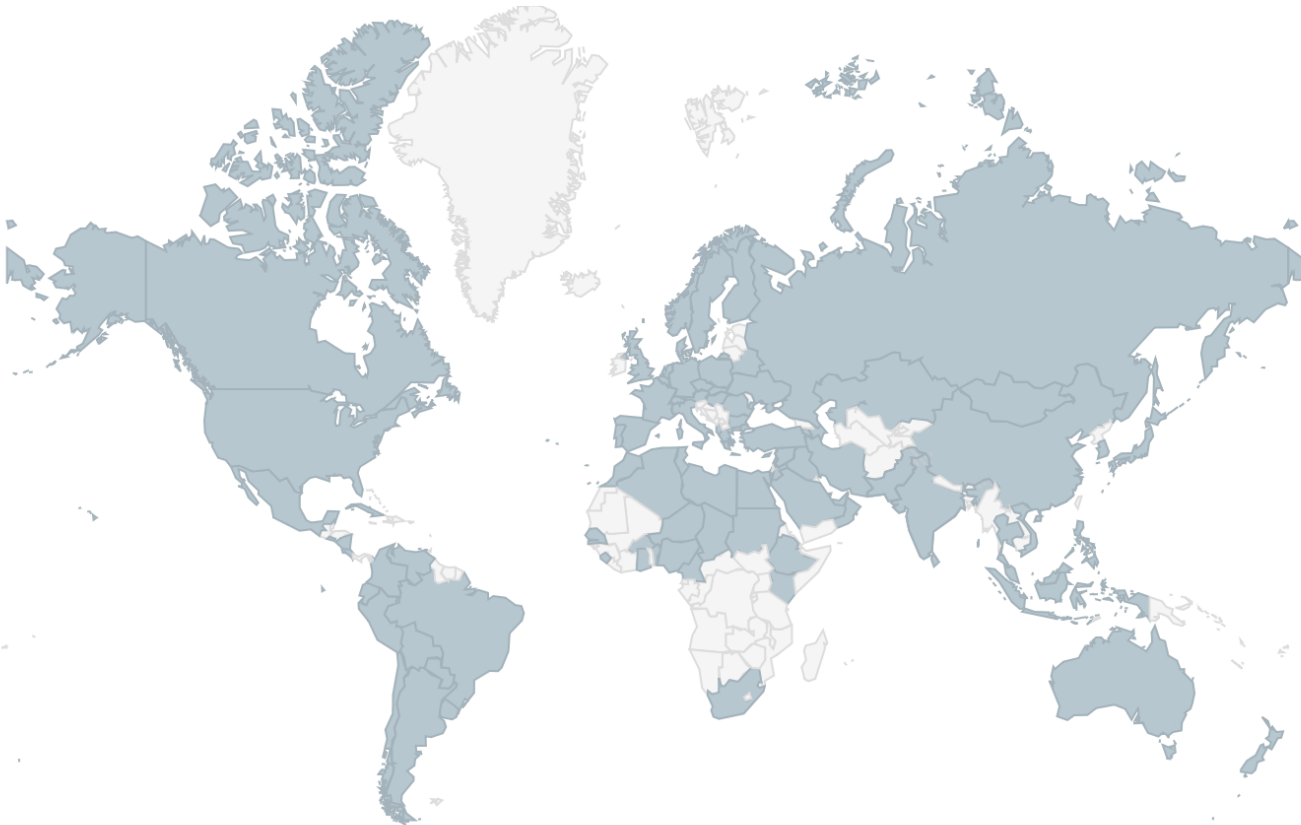
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- UN COPUOS (Committee on the Peaceful Uses of Outer Space) is the primary international forum for the development of laws and principles governing activities in outer space.
- A standing committee of the UN, founded in 1959 by 24 Member States.
 - Currently 92 Member States and a large number of permanent observers
 - The technical work of COPUOS is carried out by two subcommittees
 - Legal Subcommittee (LSC)
 - Scientific and Technical Subcommittee (STSC)
 - Decisions are reached by consensus
 - Secretariat is the UN Office for Outer Space Affairs (UN Centre Vienna)

Does not discuss disarmament-related issues

Members of the Committee on the Peaceful Uses of Outer Space

In 1959, the United Nations General Assembly established the permanent Committee on the Peaceful Uses of Outer Space with 24 members. Since then, it has grown to 92 members - one of the largest Committees in the United Nations. In addition to States, a number of international organizations, including both intergovernmental and non-governmental organizations, have observer status with COPUOS and its Subcommittees. [For the evolution of Committee Members, please click here.](#)



Source: www.unoosa.org



Space in the UN system

VIENNA

- UN COPUOS
- UNOOSA – Secretariat + Pgm Space Apps
- UNSPACE – Inter-agency Coordination



GENEVA

- Conference on Disarmament (CD)
- UNIDIR
- ITU



NEW YORK

- UN General Assembly



What COPUOS has done for space

- Five Treaties on Outer Space
- Legal Principles Governing Activities of States, Remote Sensing, Nuclear Power Sources, Direct TV Broadcasting and International Cooperation
- 130 Gen Assembly resolutions & recommendations on outer space matters
- Three UN Space Conferences (1968, 1982, 1999) & UNISPACE+50 in 2018
- UN Programme on Space Applications
 - Many capacity-building workshops each year
 - Regional Centers for Space Science & Technology Education
 - SPIDER (Disaster Management)
 - International Committee on GNSS

Activities relating to space security/sustainability

- UN COPUOS Space Debris Mitigation Guidelines
- UN COPUOS/IAEA Safety Framework for Nuclear Power Source Applications in Outer Space.
- WG on Long-Term Sustainability of Outer Space Activities of the STSC

Changing Space Domain

- Increasing number of actors
 - Over 1800 active satellites, over 25,000 trackable pieces of debris
 - Over 90 countries owning/operating satellites
 - 10 countries with independent access to space
 - 10 countries with capability to build > 1000 kg satellites
- Increasing uses of space
 - Rise of mega-constellations
 - Emergence of new kinds of activities on-orbit
 - Growing military uses of space
 - Growth of counterspace capabilities

COPUOS WG on Long-Term Sustainability of Outer Space Activities

OBJECTIVE

- To examine and propose measures to ensure the safe and sustainable use of outer space for peaceful purposes and for the benefit of all countries.

OUTPUTS

- A set of voluntary, non-binding consensus guidelines

BASED ON

- Proven measures & experience of States
- Current practices, operating procedures, technical standards and policies associated with the safe conduct of space activities throughout all the phases of the mission life cycle.

Organization of work

Expert Group A: Sustainable space utilization supporting sustainable development on Earth

CO-CHAIRS: FILIPE DUARTE SANTOS (PORTUGAL), ENRIQUE PACHECO CABRERA (MEXICO)

23 States
5 IGOs



7 candidate guidelines
4 topics for future consideration

Expert Group B: Space Debris, Space Operations and Tools to Support Collaborative Space Situational Awareness

CO-CHAIRS: RICHARD BUENNEKE (USA), CLAUDIO PORTELLI (ITALY)

23 States
4 IGOs



8 candidate guidelines
3 topics for future consideration

Expert Group C: Space Weather

CO-CHAIRS: TAKAHIRO OBARA (JAPAN), IAN MANN (CANADA)

27 States
5 IGOs



5 candidate guidelines
2 topics for future consideration

Expert Group D: Regulatory Regimes and Guidance for Actors in the Space Arena

CO-CHAIRS: SERGIO MARCHISIO (ITALY), ANTHONY WICHT & MICHAEL NELSON (AUSTRALIA)

25 States
6 IGOs



11 candidate guidelines
5 topics for future consideration

21 Agreed guidelines

- In June 2018, COPUOS the WG ended its work with 21 guidelines agreed by consensus of 87 COPUOS Member States.
- The twenty-one agreed guidelines comprise a collection of internationally recognized measures for ensuring the long-term sustainability of outer space activities and for enhancing the safety of space operations.
- They address the policy, regulatory, operational, safety, scientific, technical, international cooperation and capacity-building aspects of space activities.

Full text of agreed guidelines available in UN document A/AC.105/C.1/L.366

Two guidelines in the Safety of Space Operations section focus on space weather.

B.6 Share operational space weather data and forecasts

B.7 Develop space weather models and tools and collect established practices on the mitigation of space weather effects

B.6 Share operational space weather data and forecasts

SALIENT ELEMENTS

- Encourages States to support and promote the collection, archiving, sharing, intercalibration, continuity and dissemination of critical space weather data and space weather model outputs and forecasts.
- Encourages States to monitor space weather continuously and to share data and information in real time.
- Encourages States to adopt policies for the free and unrestricted sharing of critical space weather data from their space- and ground-based assets.
- Encourages States to share in real-time and near-real-time critical space weather data and data products in a common format, promote and adopt common access protocols for space weather data and data products, and promote interoperability of space weather data portals.

- Encourages States to undertake a coordinated approach to maintaining the long-term continuity of space weather observations and identifying and filling key measurement gaps, so as to meet critical needs for space weather information and/or data.
- Encourages States to identify high-priority needs for space weather models, space weather model outputs and space weather forecasts and adopt policies for free and unrestricted sharing of space weather model outputs and forecasts.
- All governmental, civilian and commercial space weather model developers and forecast providers are urged to allow free and unrestricted access to and archival of space weather model outputs and forecasts for mutual benefit and to promote research and development in this domain.

- States and international intergovernmental organizations should also encourage their space weather service providers to:
 - Undertake comparisons of space weather model and forecast outputs with the goal of improved model performance and forecast accuracy;
 - Openly share and disseminate historical and future critical space weather model outputs and forecast products in a common format;
 - Adopt common access protocols for their space weather model outputs and forecast products to the extent possible, to promote their ease of use by users and researchers, including through interoperability of space weather portals;
 - Undertake coordinated dissemination of space weather forecasts among space weather service providers and to operational end users.

B.7 Develop space weather models and tools

SALIENT ELEMENTS

- States and international intergovernmental organizations should undertake a coordinated approach to identifying and filling gaps in research and operational models and forecasting tools required to meet the needs of the scientific community and of the providers and users of space weather information services.
- States and international intergovernmental organizations should support and promote cooperation and coordination on ground- and space-based space weather observations, forecast modelling, satellite anomalies and reporting of space weather effects in order to safeguard space activities.



Promoting Cooperative Solutions for Space Sustainability

B.7 contd: collect established practices on the mitigation of space weather effects

- States and IGOs are encouraged to promote the development of international standards and the collection of established practices applicable for the mitigation of space weather effects in satellite design.
 - This could include the sharing of information on design practices, guidelines and lessons learned relating to mitigation of the effects of space weather on operational space systems.

- States should encourage entities under their jurisdiction and/or control to:
 - Incorporate in satellite designs the capability to recover from a debilitating space weather effect, such as a safe mode;
 - Incorporate space weather effects into satellite designs and mission planning for end-of-life disposal.
- States should undertake an assessment of the risk and socioeconomic impacts of adverse space weather effects on the technological systems in their respective countries, particularly with regard to mitigating the adverse impacts of space weather on operational space systems.

LTS continues on the agenda of the Scientific and Technical Subcommittee of COPUOS

Factors influencing negotiations

- Growing interest among COPUOS members
- Growing membership of COPUOS
- Regional and like-minded groups
- Different views on priorities
- Different views on future modality of LTS discussions
- Geopolitical developments outside of COPUOS

Space weather continues on the agenda of the Scientific and Technical Subcommittee of COPUOS

WG Chaired by Ian Mann (Canada)

- Mandated to promote cooperation in space weather-related activities among Member States and international organizations

Upcoming Event (Montreal, 10 – 11 July)

UN COPUOS Expert Group Space Weather Workshop at the Canadian Space Agency HQ in St. Hubert, Canada, just outside Montreal, on 10th and 11th July 2019 - immediately before the IAGA-related sessions being held at the IUGG in Montreal.



Promoting Cooperative Solutions for Space Sustainability



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SUMMIT FOR SPACE SUSTAINABILITY

June 25-26, 2019
Washington, DC

swfsummit.org

Thank you

